

CLAIMS:

1. An electrode for fuel cell assembled to a solid polymer electrolyte membrane comprising:
 - catalyst carrier particles;
 - catalyst retaining particles formed by retaining a catalyst at the catalyst carrier particles;
 - at least two laminated catalyst layers including the catalyst retaining particle;wherein
 - an aggregate average particle diameter of the catalyst carrier particle of one of the catalyst layers contacting the solid polymer electrolyte membrane is smaller than aggregate average particle diameters of the catalyst carrier particle of another of the catalyst layers.
2. The electrode for fuel cell according to Claim 1, wherein the aggregate average particle diameter of the catalyst carrier particle of the plural catalyst layers is slightly smaller than or the same size to the aggregate average particle diameter of the catalyst carrier of the catalyst layer at the solid polymer electrolyte membrane side.
3. A manufacturing method of an electrode for fuel cell comprising:
 - a first process for forming a first catalyst layer including catalyst retaining particles including catalyst carrier particles retained with a catalyst; and
 - a second process for forming a second catalyst layer including catalyst retaining particles including catalyst carrier particles retained with a catalyst on the first catalyst layer, the catalyst carrier particles including an aggregate average particle diameter smaller than an aggregate average particle diameter of the catalyst carrier particle of the first catalyst layer.
4. The manufacturing method of the electrode for fuel cell according to Claim 3, wherein the first catalyst layer is formed at a gas diffusion layer member including gas diffusiveness and electric conductivity at the first process; and wherein the second catalyst layer is formed on the first catalyst layer formed at the gas diffusion layer member.

5. The manufacturing method of the electrode for fuel cell according to Claim 3, wherein the first catalyst layer is formed at a gas diffusion layer member including gas diffusiveness and electric conductivity at the first process; and wherein the second catalyst layer is formed on the first catalyst layer by arranging the first catalyst layer and the second catalyst layer to face each other to be assembled after forming the second catalyst layer on a solid polymer electrolyte membrane at the second process.

6. A fuel cell comprising:

an anode provided at a first side of a solid polymer electrolyte membrane;

a cathode provided at a second side of the solid polymer electrolyte membrane; wherein at least one of the anode and the cathode comprises

catalyst carrier particles;

catalyst retaining particles formed by retaining a catalyst at the catalyst carrier particles;

a plurality of catalyst layers including the catalyst retaining particle; wherein

an aggregate average particle diameter of the catalyst carrier particle of the catalyst layer contacting the solid polymer electrolyte membrane is smaller than aggregate average particle diameters of the catalyst carrier particle of other catalyst layers.

7. The fuel cell according to Claim 6, wherein the aggregate average particle diameter of the catalyst carrier particle of the plural catalyst layers is slightly smaller than or the same size to the aggregate average particle diameter of the catalyst carrier of the catalyst layer at the solid polymer electrolyte membrane side.

8. A fuel cell comprising:

an anode provided at a first side of a solid polymer electrolyte membrane;

a cathode provided at a second side of the solid polymer electrolyte membrane; wherein at least one of the anode and the cathode is manufactured by a method comprising:

a first process for forming a first catalyst layer including catalyst retaining particles including catalyst carrier particles retained with a catalyst; and

a second process for forming a second catalyst layer including catalyst retaining particles including catalyst carrier particles retained with the catalyst on the

first catalyst layer, the catalyst carrier particles including an aggregate average particle diameter smaller than an aggregate average particle diameter of the catalyst carrier particle of the first catalyst layer.

9. A fuel cell according to Claim 8, wherein the first catalyst layer is formed at a gas diffusion layer member including gas diffusiveness and electric conductivity at the first process; and wherein the second catalyst layer is formed on the first catalyst layer formed at the gas diffusion layer member.

10. A fuel cell according to Claim 8, wherein the first catalyst layer is formed at a gas diffusion layer member including gas diffusiveness and electric conductivity at the first process; and wherein the second catalyst layer is formed on the first catalyst layer by arranging the first catalyst layer and the second catalyst layer to face each other to be assembled after forming the second catalyst layer on a solid polymer electrolyte membrane at the second process.